

PATTERN OF TUBAL PATHOLOGY IN INFERTILE WOMEN UNDERGOING HYSTEOSALPINGOGRAPHY AT THE FEDERAL MEDICAL CENTRE, YENAGOA, BAYELSA STATE, NIGERIA.

Oriji PC^{1*}, Kiridi EK², Allagoa DO¹, Omietimi JE¹, Orisabinone IB¹, Makinde OI¹, Obagah L¹, Aigere EOS¹, Agbo J¹, Oweisi PW¹, Afolabi AS¹, Kotingo EL¹, Dambo ND¹, Ikoro C¹, Mbah KM¹, Tekenah ES¹

¹Department of Obstetrics and Gynaecology, Federal Medical Centre, Yenagoa, Bayelsa State, Nigeria.

²Department of Radiology, Niger Delta University Teaching Hospital, Okolobiri, Bayelsa State, Nigeria.

*Correspondence: Dr. Oriji, Peter Chibuzor; +234 706 423 3209; chibuzor54@gmail.com

Abstract

Background: Hysterosalpingography (HSG) is an important imaging procedure in gynaecological practice used for evaluation of women with infertility. Genital infections contribute significantly to infertility in our environment by causing tubal disease. Neisseria gonorrhoeae and Chlamydia trachomatis are among the leading causes of pelvic inflammatory disease (PID), which can lead to tubal damage and then tubal factor infertility.

Objective: To determine the types of tubal pathologies in infertile women undergoing HSG.

Materials and Methods: This was a descriptive cross-sectional study. The study population consisted of consecutive 220 infertile women referred for HSG for evaluation of infertility that met the inclusion criteria for this study. Written informed consent was obtained. HSG was then carried out using standard procedures. Data collected with a predesigned proforma were analysed using statistical software (SPSS for windows® version 22, SPSS Inc.; Chicago, USA).

Results: Bilateral normal tubes characterised by free intraperitoneal spillage with normal size tubes were present in 136 patients (61.8%). Tubal blockage, either bilateral or unilateral was the most common tubal abnormality, and it was observed in 48 patients (21.9%). Left tubal blockage alone was observed in 15 patients (6.8%). Right tubal blockage alone was observed in 6 patients (2.7%).

Hydrosalpinx, either bilateral or unilateral was observed in 15 patients (6.8%). Bilateral hydrosalpinx was observed in 10 patients (4.5%). Left hydrosalpinx alone was observed in 1 patient (0.5%). Right hydrosalpinx alone was observed in 4 patients (1.8%). There was no patient with a combination of tubal blockage and hydrosalpinx.

Conclusion: Tubal occlusion and hydrosalpinx were the only tubal abnormalities observed in this study. Tubal blockage was more than hydrosalpinx, and hydrosalpinx was more on the right.

Keywords: Hysterosalpingography, Infertility, Neisseria gonorrhoeae, Chlamydia trachomatis, Tubal pathologies.

Cite this article: Oriji PC, Kiridi EK, Allagoa DO, Omietimi JE, Orisabinone IB, Makinde OI, et al. Pattern of tubal pathology in infertile women undergoing hysterosalpingography at the Federal Medical Centre, Yenagoa, Bayelsa State, Nigeria. *Yen Med J.* 2020;2(1):11–17.

INTRODUCTION

HSG is an important imaging procedure in gynaecological practice used for evaluation of women with infertility. It outlines the uterine cavity, fallopian tubes, and adjacent peritoneal

cavity following the injection of contrast material through the cervical canal.¹ HSG remains the most common method of ascertaining tubal patency in our environment and perhaps the most common form of uterine instrumentation in infertile

Women.² Genital infections contribute significantly to infertility in our environment by causing tubal disease.¹ Infertility is defined as the inability to conceive after 12 months of regular unprotected sexual intercourse. Infertility is primary if a couple is unable to achieve pregnancy, while secondary infertility is the inability to achieve pregnancy after a previous pregnancy.

Worldwide, the prevalence of infertility is highest in Eastern Europe, North Africa/Middle East, Oceania, and Sub-Saharan Africa.² Generally, 6% – 15.7% of couples are affected by infertility, worldwide.^{3,4,5,6} In Sub-Saharan Africa, the prevalence of infertility varies. It is 14.3% in The Gambia,⁴ 10.4% in Sudan⁵ and 15.7% in Nigeria.⁶ In the United Kingdom and the United States of America, infertility is estimated to be 6% and 10% respectively.⁷

Neisseria gonorrhoeae and *Chlamydia trachomatis* are among the leading causes of pelvic inflammatory disease (PID), which can lead to tubal factor infertility.¹ Ten to twenty percent of women with endo-cervical gonorrhoea or chlamydia infections have salpingitis if untreated, thereby contributing significantly to tubal factor infertility, and 12% of women present with infertility after their first experience with PID.⁷ Women with secondary infertility have more infections with *Chlamydia trachomatis* and *Neisseria gonorrhoeae* when compared with women that have primary infertility.¹

About two-thirds of the cases of infertility in Nigeria are from previous reproductive tract infections that led to severe damage to the female pelvic organs.¹ Laparoscopic investigation of infertility in Nigerian hospitals has demonstrated the presence of pelvic infection and bilateral tubal occlusion in 35% of infertile women in Ibadan, South-West, Nigeria,⁸ 44% in Ile-Ife, South-West Nigeria⁹ and 65% of women in Jos, North-Central, Nigeria.¹⁰ The objective of this study is to determine the types of tubal pathologies in infertile women undergoing HSG.

MATERIALS AND METHODS

This study was carried out at the Obstetrics and Gynaecology and the Radiology departments of the Federal Medical Centre, Yenagoa, Bayelsa State, South-South, Nigeria between June to September, 2018. It was a descriptive cross-sectional study. The study population consisted of 220 consecutive patients being investigated for infertility at the gynaecological clinic of the Federal Medical Centre, Yenagoa that were sent for hysterosalpingogram.

Women who were eligible were counselled and enrolled in the study after giving a written informed consent. An explanation of the nature of the study, the procedure and the likely benefits to the patient preceded the administration of written consent. Women who were menstruating, had abnormal uterine/vaginal bleeding, ongoing pelvic inflammatory disease, previous history of contrast hypersensitivity or who declined consent/incompletely filled consent form were excluded from the study.

Selected patients' bio-data and type of infertility (primary or secondary), previous gynaecological and obstetric history were entered into a predesigned proforma. HSG was carried out at the proliferative phase of the menstrual cycle (between the 7th and 10th day). Premedication with oral Hyoscine N Butyl Bromide 10 mg and 50 mg of Diclofenac were given 30 minutes before the procedure to reduce tubal spasm and post-procedure pelvic pain respectively. Protective lead apron and eye shield were put on. After passing urine to empty her urinary bladder, the patient was initially placed in the supine position on the X-ray table. The scout radiograph of the antero-posterior view of the pelvis was taken. She was then placed in the lithotomy position. After hand-washing and putting on sterile gloves, she was cleaned and draped to ensure privacy. With a good light source, an un-lubricated plastic disposable sterile speculum was inserted into the vagina to expose the cervix. The ecto-cervix was cleaned with savlon solution, and the anterior lip grasped with a tenaculum. The Cohen cannula was inserted into

the cervix, and the speculum was removed for the patient's comfort. The water-based contrast medium (10 – 15 ml) was warmed to body temperature, and injected slowly into the endometrial cavity. Three radiographs to outline the endometrial cavity, fallopian tubes and intraperitoneal spillage were obtained respectively. The cannula was removed, the vulva was cleaned, and she was asked to dress up. The HSG films were reported by the Consultant Radiologist and same transferred into the appropriate proforma.

DATA ANALYSIS

Data were analysed using statistical software (SPSS for windows® version 22, SPSS Inc.; Chicago, USA). Result is presented in tables, charts, frequencies and percentages.

RESULTS

The mean age of the women that participated in the study was 33.98 ± 3.85 and ranged between 24 and 40 years. Women with tertiary level of education were 156 (70.9%), those with secondary level of education were 49 (22.3%), a few women had no formal education and there was no woman with primary level of education (Figure 1). All the women that participated were Christians. Most of the women (72.2%) were nulliparous, 36 (16.4%) were multiparous, others were primiparous, and none of the women was grand multiparous (Figure 2). More than half of the women (55%) were of the Ijaw tribe (Table 1).

Two hundred and fourteen (97.3%) of the women were married in a monogamous family setting, while 6 (2.7%) of the women were married in a polygamous family setting. Most of the women that participated in this study were traders (Table 2). Figure 3 shows the distribution by type of infertility; most had secondary infertility. The average body mass index of the participants was 26.49 ± 4.38 kg/m². The range was 17.22 – 37.73 kg/m². Forty-five (20.5%) of the women were obese and 5 (2.3%) were underweight (Table 3). Majority (76%) of the women had at least one premarital termination of pregnancy.

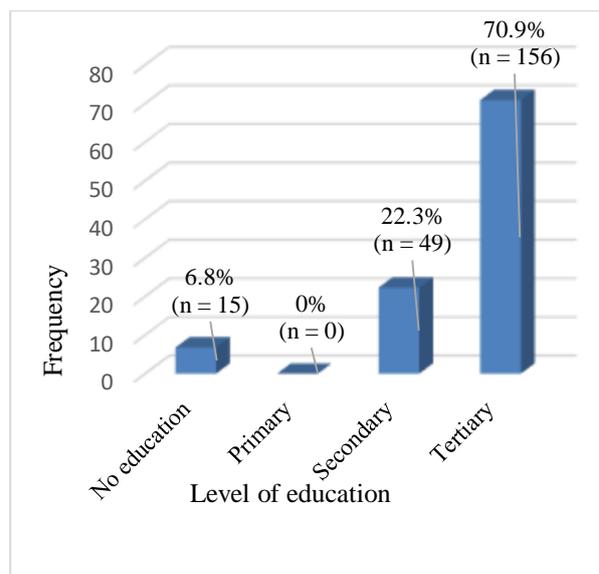


Figure 1: Distribution of level of education of the participants.

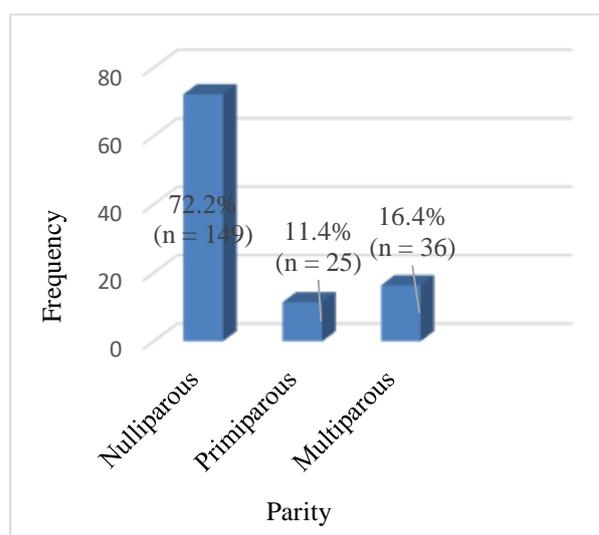


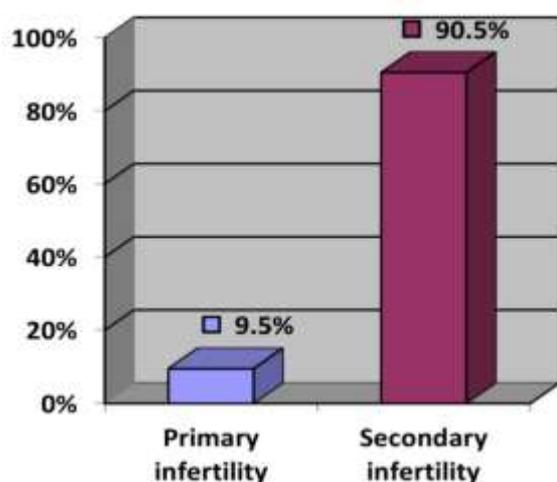
Figure 2: Distribution of parity of the participants.

Table 1: Distribution of tribe of the participants.

Tribe	Frequency	Percent (%)
Igbo	45	20.5
Ijaw	122	55.5
Yoruba	5	2.3
Others	48	21.8
Total	220	100

Table 2: Distribution of occupation of the participants.

Occupation	Frequency	Percent (%)
Trader	100	45.5
Civil Servant	60	27.3
Engineer	1	0.5
Banker	3	1.4
Lawyer	3	1.4
Student	22	10.0
Military officer	5	2.3
Caterer	10	4.5
Teacher	6	2.7
Unemployed	10	4.5
Total	220	100

**Figure 3: Distribution of the type of infertility in the participants.****Table 3: Distribution of body mass index of the participants.**

BMI	Frequency	Percent (%)
Underweight	5	2.3
Normal	75	34.1
Overweight	95	43.2
Obese	45	20.5
Total	220	100

Table 4 shows type of tubal blockage. Bilateral normal tubes characterised by free intraperitoneal spillage with normal size tubes were present in 136 patients (61.8%). Tubal blockage, either bilateral or unilateral was observed in 48 patients (21.9%). Left tubal blockage alone was more common than right tubal blockage alone. Hydrosalpinx, either bilateral or unilateral was observed in 15 patients (6.8%). Bilateral hydrosalpinx was observed in 10 patients (4.5%). Right hydrosalpinx alone was more common than left hydrosalpinx alone. There was no patient with a combination of tubal blockage and hydrosalpinx.

Table 4: Pattern of tubal pathology as seen on hysterosalpingography.

Pathology	Number	Percent
Both normal	136	61.8
Right normal tube, Left blocked	15	6.8
Right normal tube, Left hydrosalpinx	1	0.5
Left normal tube, Right blocked	6	2.7
Left normal tube, Right hydrosalpinx	4	1.8
Bilateral tubal blockage	48	21.9
Bilateral hydrosalpinx	10	4.5
Total	220	100

DISCUSSION

The mean age of the women that participated in the study was 33.98 ± 3.85 and ranged between 24 and 40 years. This range is within the reproductive age group. Sexually transmitted infections which predispose to tubal blockade occur more among women of reproductive age group. Majority of the women were older than 30 years. With advancing female age, there is increase in the number of women with age-related infertility, tubal blockage, uterine fibroids and endometriosis.¹¹

In this study, 70.9% of the women had tertiary level of education, which is consistent with studies from various parts of Nigeria.¹ There were more traders compared to other professionals. This is as a result of the fact that this environment is not industrialised. Therefore, more people go into trading rather than wait for availability of white-collar jobs.

This study revealed that women with secondary infertility were more and accounted for 90.5% of the participants. This is probably due to the fact that most of the women with secondary infertility would have had a previous pelvic infection causing bilateral tubal blockage.¹ Majority of the women in this study had at least one premarital termination of pregnancy which is a risk factor for infection with chlamydia and gonorrhoea.

In this study, tubal occlusion and hydrosalpinx were the only tubal abnormalities observed. This is similar to reports from some other studies.^{12,13} Forty-eight (21.8%) patients had bilateral tubal blockage. It is often difficult to differentiate between tubal blockage and bilateral cornual spasm on hysterosalpingography.¹⁴ Smooth muscle encloses the cornual part of the fallopian tube.¹⁵ Muscle spasm can lead to transient occlusion of the fallopian tube and prevent contrast from filling a patent fallopian tube.¹⁵ This is the reason the patients that participated in this study received oral hyoscine N butyl bromide 30 minutes before the procedure to prevent tubal spasms that may mimic tubal blockage. Muscle spasm is characterised by a rounded smooth cornual margin; cornual occlusion is characterised by pointed or irregular cornual margin.¹⁵ Laparoscopy, and dye test is the gold standard for evaluation of tubal occlusion, and is done to confirm tubal occlusion after hysterosalpingography. Other tests for tubal patency are hysterosalpingo-contrast-sonography, selective salpingography and tubal catheterisation, transvaginal hydrolaparoscopy, salpingoscopy, falloposcopy and fertiloscopy.

Hydrosalpinx is defined as fluid-filled dilatation of the fallopian tube,¹⁶ and it appears as a contrast filled and dilated fallopian tube, often without free spill of contrast into the peritoneum on hysterosalpingography. Bilateral hydrosalpinx was present in 10 (4.5%) patients, while 5 (2.3%) patients had unilateral hydrosalpinx. More patients had right hydrosalpinx, which correlates with the report from an earlier study.¹⁷ This increased incidence of right hydrosalpinx was explained in another study to be due to the presence of the

appendix.¹⁸ For better visualisation of hydrosalpinx, the film taken 30 minutes after the end of the procedure is preferred.¹⁸ This delay allows for more accumulation of contrast media within the dilated fallopian tube(s).¹⁸

CONCLUSION

Hysterosalpingography remains the most common method of ascertaining tubal patency in our environment. Tubal occlusion and hydrosalpinx were the only tubal abnormalities observed in this study. Tubal blockage was more than hydrosalpinx, and hydrosalpinx was more on the right.

LIMITATION

This was a hospital-based study. The results may not reflect the findings in other tertiary institutions in Nigeria or the West African sub-region.

ACKNOWLEDGEMENT

The authors appreciate the patients that participated in this research, and the consultants/residents at the departments of obstetrics & gynaecology and radiology for their roles in making this research possible.

SOURCE OF FUNDING

The research was funded by the authors.

CONFLIT OF INTEREST

The authors declare that there are no conflicts of interest.

AUTHORS' CONTRIBUTIONS

Author 1 designed the study, wrote the protocol, managed literature searches and wrote the first draft of the manuscript. Author 2 reported all the HSG films. Authors 3, 4 and 8 reviewed and supervised the analyses of the study. Author 13 performed the statistical analysis, Authors 6 – 16 participated in literature searches. All authors read and approved the final manuscript

CONSENT

Written informed consent was obtained from every patient that participated in the research.

ETHICAL APPROVAL

The research work was examined and approved by the hospital research and ethics committee.

REFERENCES

1. Oguntoyinbo AE, Adesina KT, Olarinoye AO, Aboyeji AP, Olanrewaju WI, Oniyangi M. Pre-HSG microbial isolates from endocervical swabs in infertile women in Ilorin, Nigeria. *West Afr J Radiol.* 2014;21(2):59–63. DOI: 10.4103/1115-1474.134604.
2. Mascarenhas MN, Flaxman SR, Boerma T. National, regional, and global trends in infertility prevalence since 1990: a systematic analysis of 277 health surveys. *PLoS Med.* 2012;9(12):e1001356. DOI: 10.1371/journal.pmed.1001356.
3. Anyanwu MO, Idoko P. Prevalence of Infertility at the Gambian Teaching Hospital. *Women's Health Gynaecol.* 2017;3(2):1–4.
4. Nezar M, Abdalla MD. Pattern of infertility among couples in Gezira area, Sudan. *Med J Cairo Univ.* 2011;79(1):529–532.
5. Abubakar AP, Yusuf TS. The profile of infertility in a Teaching Hospital in North West Nigeria. *Sahel Med J.* 2014;17(1):7–11.
6. Ugwuja EI, Ugwu NC, Ejikeme BN. Prevalence of Low Sperm Count and Abnormal Semen Parameters in Male Partners of Women Consulting at Infertility Clinic in Abakaliki, Nigeria. *Afr Reprod Health.* 2008;12(1):67–73.
7. Novy MJ, Eschenbach DA, Witkin SS. Infections as a cause of infertility. *Global Library of Women's Medicine.* Available from: https://www.glowm.com/section_view/heading/infections-as-a-cause-of-infertility/item/327. Published 2008. Accessed November 11, 2019.
8. Olorin EO, Ojengbede O, Falase AO. Laparoscopic evaluation of the tuboperitoneal factor in infertile Nigerian women. *Int J Gynaecol Obstet.* 1987;25(1):47–52.
9. Okonofua FE, Esen UI, Nimalaraj T. Hysterosalpingography versus laparoscopy in tubal infertility. Comparison based on findings at laparotomy. *Int J Gynaecol Obstet.* 1989;28:143–147.
10. Otubu JA, Sagay AS, Dauda S. Hysterosalpingogram, laparoscopy and hysteroscopy in the assessment of the infertile Nigerian female. *E Afr Med J.* 1990;67(5):370–372.
11. American College of Obstetricians and Gynecologists Committee on Gynecologic Practice and Practice Committee. Female age-related fertility decline. Committee Opinion No. 589. *Fertil Steril.* 2014;101(3):633–634.
12. Raymont A, Arronet GH, Arrata WS. Review of 500 cases of infertility. *Int J Fertil.* 1969;14(2):141–153.
13. Mati JK, Senai SKA, Oyieke JB, Sekadde CBK, Njoroge JK, Muta MN. Clinical aspects of infertility in Kenya. A comprehensive evaluation of the couples. *J Obstet Gynaecol East Central Afr.* 1989;(6):61–63.
14. Lee SI, Kilcoyne A. Hysterosalpingography. UpToDate. Available from: https://www.uptodate.com/contents/hysterosalpingography?source=history_widget. Accessed November 11, 2019.
15. Horwitz RC, Morton PC, Shaff MI, Hugo P. A radiological approach to infertility-hysterosalpingography. *Br J Radiol.* 1979;52(616):255–262.
16. Rezvani M, Shaaban AM. Fallopian tube disease in the nonpregnant patient. *Radiographics.* 2011;31(2):527–548.
17. Bello TO. Pattern of tubal pathology in infertile women on hysterosalpingography in Ilorin, Nigeria. *Ann Afr Med.* 2004;3(2):77–79.
18. Adetiloye VH. Radiological patterns of diseases on hysterosalpingography dissertation. Lagos, Nigeria: National Postgraduate Medical College of Nigeria; 1988:64–100.